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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/862,755	05/21/2001	Ye Li	1999-0759	8169

7590 05/27/2005

S. H. Dworetsky  
AT&T Corp, Room 2A-207  
One AT&T Way  
Bedminster, NJ 07921

EXAMINER

LE, AMANDA T

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 05/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/862,755

Applicant(s)

Li, YE

Examiner

Amanda T. Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2004.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17, 21-23, 27 and 28 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-17, 21-23, 27 and 28 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

*Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-17, 21-23, 27, 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Heiskala.

Heiskala discloses a method and apparatus for estimating channel frequency responses in an OFDM system comprising the following claimed limitations:

In claims 1, 7, 21, “transmitting a set of first training symbols using a first communication channel” (Fig. 4, 402, 404, 406, col. 6, lines 29-31), “transmitting one or more sets of second training symbols using one or more second communication channels” (Fig. 4, 408, 410, 412, col. 6, lines 29-31), “one or more second sets of training symbols are based on the set of first training symbols” (col. 7, lines 5-10), “a cross-correlation estimate between the first set of training symbols and at least one of the sets of second training symbols is essentially zero” (col. 7, lines 45-48);

In claim 2, “the first set of training symbols is transmitted using an orthogonal frequency division multiplexing technique” (Abstract);

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In claim 3, “each cross-correlation estimate between the first set of training symbols and every set of the one or more sets of second training symbols is essentially zero” (col. 7, lines 45-48);

In claim 4, “each cross-correlation estimate between every two sets of training symbols of the one or more sets of second training symbols is essentially zero” (col. 7, lines 60-65);

In claims 5, 6, 22, “at least one set of the one or more sets of second training symbols is substantially identical to the set of first training symbols with a respective phase shift” (col. 7, line 53);

In claims 8-10, 16, 27, “receiving the set of first training symbols” (Fig. 4, 416); “receiving at least one of the one or more sets of second training symbols” (Fig. 4, 416), “characterizing two or more communication channels based on the set of first training symbols and the one or more second sets of training symbols” and “does not use a matrix inversion”(col. 7, lines 20, 35-40); “a cross-correlation estimate between the first set of training symbols and at least one of the sets of second training symbols is essentially zero” (col. 7, lines 45-48);

In claim 11, “the first set of training symbols is transmitted using an orthogonal frequency division multiplexing technique” (Abstract);

In claim 12, “each cross-correlation estimate between the first set of training symbols and every set of the one or more sets of second training symbols is essentially zero” (col. 7, lines 45-48);

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In claim 13, “each cross-correlation estimate between every two sets of training symbols of the one or more sets of second training symbols is essentially zero” (col. 7, lines 60-65);

In claims 14, 15, 27, “at least one set of the one or more sets of second training symbols is substantially identical to the set of first training symbols with a respective phase shift” (col. 7, line 53);

In claim 17, “the set of first training signals is transmitted using a first transmit device” (Fig. 4, 402, 404, 406, col. 6, lines 29-31), “the one of the one or more sets of second training signals is transmitted using a second transmitting device” (Fig. 4, 408, 410, 412, col. 6, lines 29-31),

In claim 23 and 28, “the set of second training symbols is related to the set of first training symbols according to:  $t_2[n, k] = t_1[n, k] W_K^{-kl_0}$ ” (col. 7, lines 60-65, when  $K = 4kl_0$ ).

### ***Response to Arguments***

3. Applicant's arguments filed on 11/24/05 have been fully considered but they are not persuasive.

Applicants assert that, “The present invention utilizes matrix theory and mathematics to determine the cross-correlation energy between two sets of training symbols (i.e., a cross-correlation estimate). When the cross-correlation between the sets of training symbols is essentially zero, channel estimation can be achieved without a matrix inversion. This effectively simplifies the method of determining the channel estimation.” Nonetheless, it is noted that the features upon which applicant relies are not

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recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims.

Further, Applicants argue that, “Heiskala fails to teach or to suggest a method or apparatus for communicating, where a cross-correlation estimate between the first set of training symbols and at least one set of second training symbols is essentially zero, as positively claimed by the Applicant.” Applicants’ attention is directed toward Heiskala’s teachings (col. 7, lines 52-62) of training symbol B1 is orthogonal to training symbol A1. It is therefore, by property, the cross correlation between A1 and B1 are zero. Accordingly, Heiskala inherently discloses the claimed limitation of “the cross-correlation between two different sets of said training symbols is zero.”

### ***Conclusion***

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

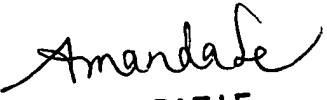
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amanda T. Le whose telephone number is (571) 272-3052. The examiner can normally be reached on 10:30 A.M. through 7:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
AMANDA T. LE  
PRIMARY EXAMINER